





5/45

DART AEROSPACE LTD	Work Order:	24537
Description: Tow Ring	Part Number:	D2968-041
Dwg: D2968 Rev. B1	Qty:	40
<i>40.06.01 (P 04.06.01)</i>		Page 1 of 1

Step	Location	Procedure	By	Date	Qty
1	DC	Issue Traveler	<i>JA</i>	05.10.12	40
2	MC	Turn blank as per Folio FA047 and Dwg D2968 Material: AISI 4130 Ø 3/4 " Bar (M4130N-R0.750) Identify for D2968-1	<i>M18767</i> <i>Batch: M15619</i>	<i>05/10/15</i>	<i>42</i>
3	QC2	Inspect parts as they come off the CNC machine	<i>PM</i>	<i>05/10/15</i>	<i>42</i>
4	MC	Deburr, no sharp edges	<i>PM</i>	<i>05/10/15</i>	<i>42</i>
5	QC8	Second check	<i>J.L</i>	<i>05.10.16</i>	<i>42</i>
6	MS	Turn blank as per Folio FA049 and Dwg D2968 Material: AISI 4130 3.00" OD x 2.00" ID tubing (M4130N-T3000W500) Identify as D2968-5	<i>M18948</i> <i>Batch: M15213</i>	<i>05/11/14</i>	<i>45</i>
7	QC2	Inspect parts as they come off the CNC machine	<i>PM</i>	<i>05/11/16</i>	<i>45</i>
8	MS	Deburr, no sharp edges	<i>PM</i>	<i>05/11/16</i>	<i>45</i>
9	QC8	Second check	<i>J.L</i>	<i>05/11/18</i>	<i>45</i>
10	MV	Machine D2968-1 as per Folio FA047 and Dwg D2968 Identify as D2968-1	<i>En</i>	<i>05/11/18</i>	<i>45</i>
11	QC2	Inspect parts as they come off the CNC machine	<i>En</i>	<i>05/11/18</i>	<i>45</i>
12	MV	Deburr	<i>En</i>	<i>05/11/18</i>	<i>45</i>
13	QC8	Second check	<i>DG</i>	<i>05.10.18</i>	<i>45</i>
14	MS	Weld D2968-1 & D2968-5 as per Dwg D2968 & QSI 004 using 4130 welding rod Identify as D2968-041	<i>Batch: M15684</i> <i>CPL</i>	<i>06/12/05</i>	<i>41</i>
15	QC9/5	Inspect weld	<i>DA</i>	<i>05/12/06</i>	<i>41</i>
16	PG	Issue P/O: <i>248</i> Description: D2968-041 to heat treat to ultimate tensile strength 125ksi as per Dwg D2968 Conformity sheet required	<i>UA</i>	<i>05/12/07</i>	<i>41</i>
17	PG	Issue P/O: <i>243</i> Cad Plate per QQ-P-416F Class I Type II Conformity sheet required	<i>DL</i>	<i>05/12/07</i>	<i>41</i>
18	RG	Receive and inspect for transit damage Ensure conformity sheets are attached	<i>Co</i>	<i>06/01/05</i>	<i>41</i>
19	QC3	Inspect Cad Plate	<i>ML</i>	<i>06/01/09</i>	<i>41</i>
20	FP	Powder Coat Gloss White (Ref: 4.3.5.2) as per QSI 005 4.3 ***DO NOT POWDER COAT THREADS***	<i>ML</i>	<i>06/01/10</i>	<i>41</i>
21	QC3	Inspect Powder Coat	<i>Co</i>	<i>06/01/11</i>	<i>41</i>
22	ST	Identify and Stock	<i>Co</i>	<i>06/01/11</i>	<i>41</i>
23	AC	Cost / part	<i>595</i>	<i>06-01-13</i>	<i>41</i>
24	DC	Close W/O Inspect Level 21			

Rev	Date	Change	Revised By	Approved
A	00.04.25	New issue	EC	
B	02.05.11	Added welding rod batch number	NG	
C	03.04.11	Reformat; Incorporated D2968-1/-5	KJ/RF	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Mfg / Design Mgr	Approval QC Inspector

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Design Mgr	Approval QC Inspector
			Initial Design Mgr	Action Description Design Mgr	Sign & Date			
05/10/18	# 10	"y" axis did not go to zero one part scrap		Scrap and Destroy and Replace	EW 05/16/18	 05/10/18	 05/10/18	 05/10/18

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

NOTE: Date & initial all entries

QA: N/C Closed: _____ Date: _____

DART AEROSPACE LTD		Work Order: 24537
Description: Stem		Part Number: D2968-1
Inspection Dwg: D2968	Rev: B1	Page 1 of 1

FIRST ARTICLE INSPECTION CHECKLIST

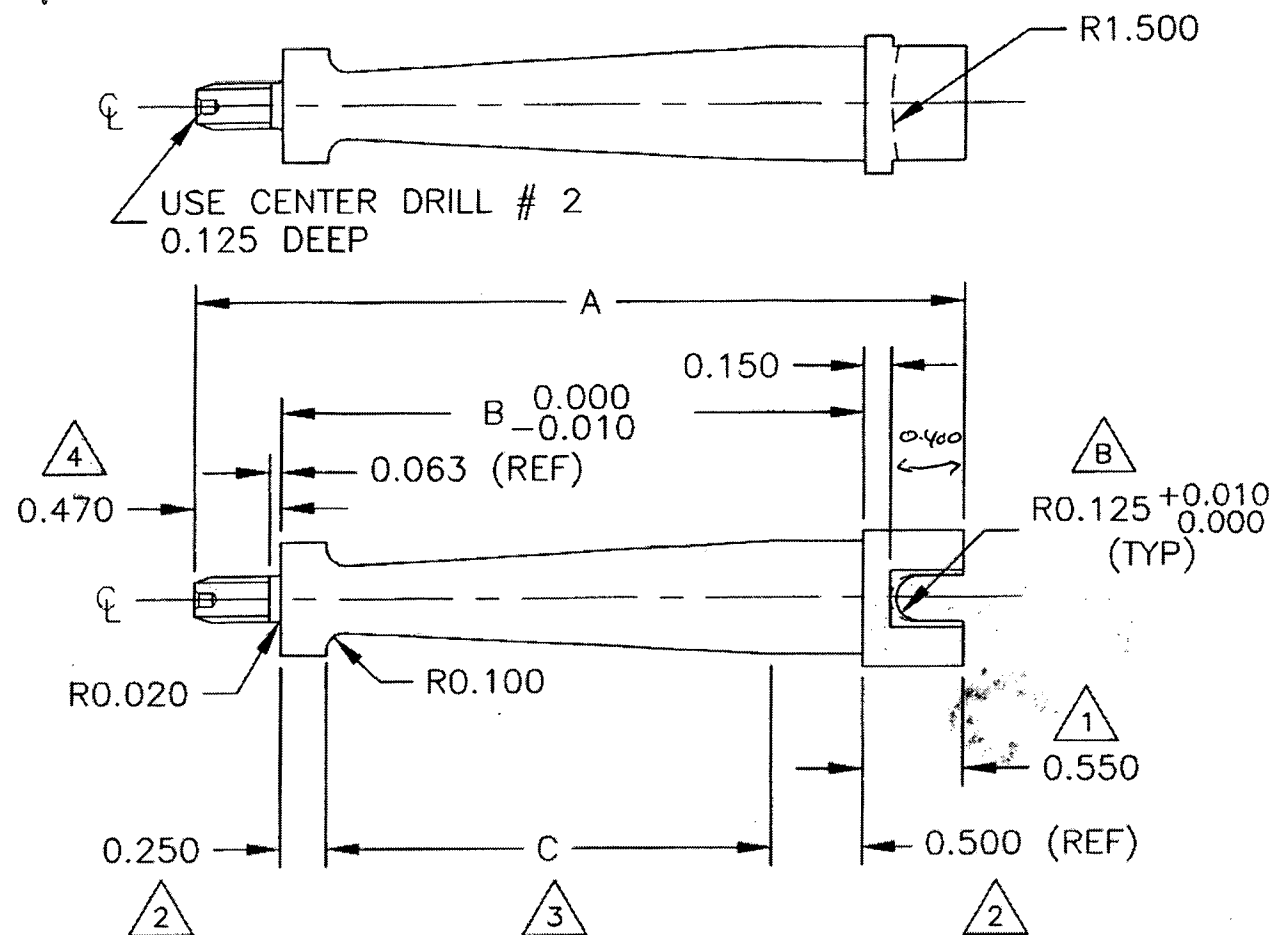
☒ First Article ☐ Prototype

Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
5.040	+/-0.010	5.039	✓			
4.020	+0.000/-0.010	4.013	✓			
3.270	+/-0.010	3.263	✓			
0.470	+/-0.010	0.475	✓			
0.250	+/-0.010	0.251	✓			
0.550	+/-0.010	0.549	✓			
Ø0.750	+/-0.010	Ø0.748	✓			
Ø0.625	+/-0.010	Ø0.623	✓			
Ø0.363	+/-0.010	Ø0.364	✓			
0.250	+0.010/-0.000	0.251	✓			
0.625	+/-0.010	0.627	✓			
0.150	+/-0.010	0.151	✓			
Ø0.250	+0.010/-0.000					
Ø0.250	+0.010					
Ø0.250	+0.010					
1/4-28 Major dia	0.243 - 0.249	0.246	✓			
MOW	0.261 - 0.267	0.264	✓			

Measured by: <i>gmk</i>	Audited by: <i>J.L.</i>	Prototype Approval:	N/A
Date: 05/10/14	Date: 05/10/14	Date:	N/A

Rev	Date	Change	Revised by	Approved
A	04.02.25	New Issue P/O D2968-041	KJ/RF	
B	05.05.26	Dimensions added	KJ/JLM	

RELEASED
05-05-26



PART NUMBER	A	B	C
D2968-1	5.040	4.020	3.270
D2968-3	4.200	3.180	2.430

D2968-1/-3 STEM

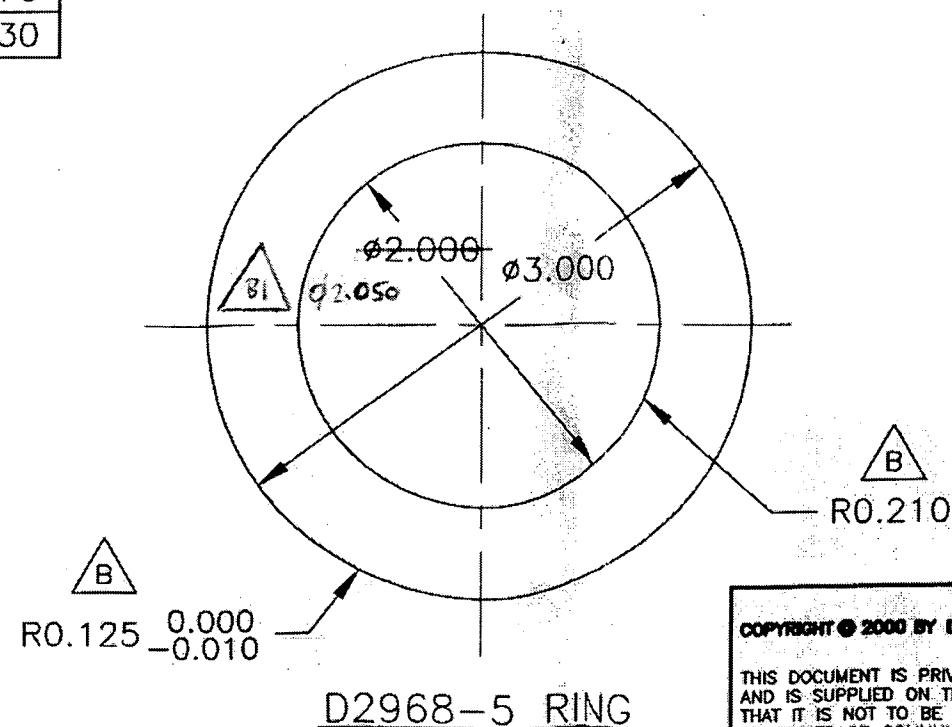
D2968-1 AND D2968-3 STEM:

MATERIAL: AISI 4130

- 1 $\phi 0.750$ O.D.
 - 2 $\phi 0.625$ O.D.
 - 3 MACHINE UNIFORM TAPER FROM $\phi 0.363$ O.D. TO $\phi 0.625$ O.D.
 - 4 1/4-28 UNF THREAD WITH 0.063 GRIP
- MACHINE ALL INSIDE EDGES WITH A 0.010 RADIUS UNLESS OTHERWISE INDICATED
TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED

D2968-5 RING:

MATERIAL AISI 4130
TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED



RELEASED

UNDER REVIEW

USE 2968-1 STEM
FOR -041
USE 2968-3 STEM
FOR -043

D2968-041 AND D2968-043 TOW RING:

WELD PER QSI 004 ON ALL EDGES BETWEEN STEM AND RING
HEAT TREAT TO MIN ULTIMATE TENSILE STRENGTH OF 125 KSI
FINISH: CAD PLATE ENTIRE ASSEMBLY PER

QQ-P-416F CLASS I TYPE II
POWDER COAT WHITE (REF 4.3.5.2) PER DART
QSI 005 4.3 (EXCEPT THREADS)

TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED

B	00.05.31	R0.125 AND R0.210 WERE 0.060 x 45°
A	00.03.07	NEW ISSUE
DESIGN	DRAWN BY	DART DART AEROSPACE LTD. HAWKESBURY, ONTARIO, CANADA
CHECKED	APPROVED	DRAWING NO. D2968 REV. B
DATE	00.05.31	TITLE TOW RING SHEET 1 OF 1
		SCALE 1:1

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UNCONTROLLED COPY

WORK ORDER

24537

0002 SW 0502 2000 0020 0400 18

Dart Aerospace Ltd.
Hawkesbury

Job Costing Report

Oct 11, 2005
11:50 am

Work Order No : 0024537

Project Name : D2968-041

Project For : WK545

Work Order Type : Main

Main WO Number :

House Part Number : D2968-041

Description : Tow Ring

Manufactured : Yes

Amount Req'd : 40

Amount Done : 0

Start Date : 10-11-05

Est Finish Date : 11-15-05

Act Finish Date :

Drawings Req'd : No

Ok for Approval :

Approval Rec'd :

Department Code:

Burden Flags : NNNNNNN

WO Status : Open

Invoice State : Not Invoiced

Invoice Date :

Invoice Number :

Invoice Amount : 0.00

Order Entry No :

OE Value : 0.00

Est Mark Up : 0.000%

Actual Mark Up : 0.000%

\$0 Posted to Finished Goods

	Estimated	Actual	Var. %	Posted	To Post
Material Cost :	0.00	0.00	0.00	0.00	0.00
Engineering Hours :	0.00	0.00	0.00		
Engineering Cost :	0.00	0.00	0.00	0.00	0.00
Production Hours :	0.00	0.00	0.00		
Production Cost :	0.00	0.00	0.00	0.00	0.00
Packaging Hours :	0.00	0.00	0.00		
Packaging Cost :	0.00	0.00	0.00	0.00	0.00
OverHead Hours :	0.00	0.00	0.00		
OverHead Cost :	0.00	0.00	0.00	0.00	0.00
CNC Hours :	0.00	0.00	0.00		
CNC :	0.00	0.00	0.00	0.00	0.00
Misc. Hours :	0.00	0.00	0.00		
Misc. :	0.00	0.00	0.00	0.00	0.00
Burden :	0.00	0.00	0.00		
Total Cost :	0.00	0.00	0.00		
Mark up :	0.000	0.000			
Selling Cost :	0.00	0.00			

Labour Hrs/Amount Done : 0.00

Profits/(Loss) : 0.00

Estimated

Actual

Job Costing Report

Dart Aerospace Ltd.
Hawkesbury

Nov 08, 2005
12:22 pm

Work Order No : 0024537
Project Name : D2968-041
Project For : WK545
Work Order Type : Main
Main WO Number :
House Part Number : D2968-041
Description : Tow Ring
Manufactured : Yes
Amount Req'd : 40
Amount Done : 0
Start Date : 10-11-05
Est Finish Date : 11-15-05
Act Finish Date :
Drawings Req'd : No
Ok for Approval :
Approval Rec'd :

Department Code:
Burden Flags : NNNNNNNN
WO Status : Open
Invoice State : Not Invoiced
Invoice Date :
Invoice Number :
Invoice Amount : 0.00
Order Entry No :
OE Value : 0.00
Est Margin : 0.000%
Actual Margin : 0.000%
\$0 Posted to Finished Goods

	Estimated	Actual	Var. %	Posted	To Post
Material Cost :	0.00	0.00	0.00	0.00	0.00
Engineering Hours :	0.00	0.00	0.00		
Engineering Cost :	0.00	0.00	0.00	0.00	0.00
Production Hours :	0.00	20.50	100.00		
Production Cost :	0.00	423.28	100.00	0.00	423.28
Packaging Hours :	0.00	0.00	0.00		
Packaging Cost :	0.00	0.00	0.00	0.00	0.00
OverHead Hours :	0.00	0.00	0.00		
OverHead Cost :	0.00	0.00	0.00	0.00	0.00
CNC Hours :	0.00	23.75	100.00		
CNC :	0.00	0.00	0.00	0.00	0.00
Misc. Hours :	0.00	0.00	0.00		
Misc. :	0.00	0.00	0.00	0.00	0.00
Burden :	0.00	0.00	0.00		
Total Cost :	0.00	423.28	100.00		
Margin :	0.000	0.000			
Selling Cost :	0.00	423.28			

	Estimated	Actual
Labour Hrs/Amount Done :	0.00	0.00
Profits/(Loss) :	0.00	(-423.28)

MIS d/B
11-13

Date: Monday, 14/11/2005 8:16:43 AM
 User: Alba Panzuto

Process Sheet

Customer : CU-DAR001 Dart Helicopters Services Drawing Name : TOW RING
 Job Number : 24537
 Estimate Number : 10396
 P.O. Number : Part Number : D2968041
 This Issue : 14/11/2005 S.O. No. : Drawing Number : D2968 UNDER REVIEW
 Prsht Rev. : NC Project Number :
 First Issue : / / Type : MACHINED PARTS Drawing Revision : B1
 Previous Run : 23761 Material :
 Written By : Due Date : 10/12/2005 Qty: 40 Um: Each
 Checked & Approved By :
 Comment : Est:C 03.04.11 Reformat; Incorporated D2968-1/-5 KJ/RF

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
---------	-----------------------	---------------

1.0	24537A	STEM
-----	--------	------



Comment: Sub-Component STEM

2.0	24537B	RING
-----	--------	------



Comment: Sub-Component RING

3.0	D29681	Stem
-----	--------	------

4.0	D29685	Ring
-----	--------	------

5.0	LARGE FAB 1	LARGE FABRICATION RESOURCE 1
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Comment: LARGE FABRICATION RESOURCE 1

Weld D2968-1 & D2968-5 as per Dwg D2968 & QSI 004 using 4130 welding rod Identify as D2968-041

Batch: _____

6.0	QC5/9	WELD INSPECTION
-----	-------	-----------------



Comment: WELD INSPECTION

7.0	PG	PURCHASING
-----	----	------------



Comment: PURCHASING

Issue P/O: _____

Description: D2968-041 to heat treat to ultimate tensile strength

125ksi as per Dwg D2968

Conformity sheet required

Issue P/O: _____

Cad Plate per QQ-P-416F Class I Type II

Date: Monday, 14/11/2005 8:16:43 AM
User: Alba Panzuto

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: TOW RING

Job Number: 24537

Part Number: D2968041

Job Number:



Seq. #:

Machine Or Operation:

Description :

Conformity sheet required

8.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Receive & Inspect For Transit Damage

Ensure certificate of conformity is attached

9.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT CAD PLATE

10.0

POWDER COATING

POWDER COATING



Comment: POWDER COATING

Powder Coat White Gloss (Ref: 4.3.5.2) as per QSI 005 4.3

DO NOT POWDER COAT THREADS

11.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT

12.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and Stock

Location: _____

13.0

DC

DOCUMENT CONTROL



Comment: DOCUMENT CONTROL

Inspection Level 21

Job Completion



Date: Monday, 14/11/2005 8:16:46 AM
 User: Alba Panzuto

Process Sheet

Customer : CU-DAR001 Dart Helicopters Services Drawing Name : STEM
 Job Number : 24537A
 Estimate Number : 10394
 P.O. Number : Part Number : D29681
 This Issue : 14/11/2005 S.O. No. : Drawing Number : D2968 UNDER REVIEW
 Prsht Rev. : NC Project Number :
 First Issue : / / Type : MACHINED PARTS Drawing Revision : B1
 Previous Run : 23761A Material :
 Written By : Due Date : 10/12/2005 Qty: 40 Um: Each
 Checked & Approved By :
 Comment : Est:C 03.04.11 Reformat; Incorporated D2968-1/-5 KJ/RF

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
1.0	M4130NR0750	4130 steel rod .750"
2.0	HARDINGE	HARDINGE CNC LATHE SMALL
Comment: HARDINGE CNC LATHE SMALL 1-Turn Blank as per Folio FA047 and Dwg D2968 2-Deburr, no sharp edges		
3.0	QC2	INSPECT PARTS AS THEY COME OFF MACHINE
Comment: INSPECT PARTS AS THEY COME OFF MACHINE		
4.0	HAAS1	HAAS CNC VERTICAL MACHINING #1
Comment: HAAS CNC VERTICAL MACHINING #1 1- Machine as per Folio FA047 and Dwg D2968 2- Deburr		
5.0	QC2	INSPECT PARTS AS THEY COME OFF MACHINE
Comment: INSPECT PARTS AS THEY COME OFF MACHINE		
6.0	QC8	SECOND CHECK
Comment: SECOND CHECK		
7.0	PACKAGING 1	PACKAGING RESOURCE #1
Comment: PACKAGING RESOURCE #1 Identify and Stock Location: _____		

Date: Monday, 14/11/2005 8:16:46 AM

User: Alba Panzuto

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: STEM

Job Number: 24537A

Part Number: D29681

Job Number:



Seq. #:

Machine Or Operation:

Description :

8.0

DC

DOCUMENT CONTROL



Comment: DOCUMENT CONTROL

Inspection Level 21

Job Completion



Date: Monday, 14/11/2005 8:16:47 AM
 User: Alba Panzuto

Process Sheet

Customer	: CU-DAR001 Dart Helicopters Services	Drawing Name	: RING
Job Number	: 24537B		
Estimate Number	: 10395		
P.O. Number	:	Part Number	: D29685
This Issue	: 14/11/2005	S.O. No.	:
Prsht Rev.	: NC	Drawing Number	: D2968 UNDER REVIEW
First Issue	: / /	Project Number	:
Previous Run	: 24418B	Drawing Revision	: B1
	Type : MACHINED PARTS	Material	:
Written By	:	Due Date	: 10/12/2005
Checked & Approved By	:	Qty:	40
Comment	: Est:C 03.04.11 Reformat; Incorporated D2968-1/-5 KJ/RF	Um:	Each

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
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1.0	M4130NT3000W500	4130 Tube 3"ODx.5"W
-----	-----------------	---------------------

2.0	MORI SEIKI	MORI SEIKI CNC LATHE LARGE
-----	------------	----------------------------



Comment: MORI SEIKI LATHE
 1-Turn Blank as per Folio FA049 and Dwg D2968
 2-Deburr, no sharp edges

3.0	QC2	INSPECT PARTS AS THEY COME OFF MACHINE
-----	-----	--



Comment: INSPECT PARTS AS THEY COME OFF MACHINE

4.0	QC8	SECOND CHECK
-----	-----	--------------



Comment: SECOND CHECK

5.0	PACKAGING 1	PACKAGING RESOURCE #1
-----	-------------	-----------------------



Comment: PACKAGING RESOURCE #1
 Identify and Stock
 Location: _____

6.0	DC	DOCUMENT CONTROL
-----	----	------------------



Comment: DOCUMENT CONTROL
 Inspection Level 21

Job Completion



MANCO DOMPLEX

8895 Crescent 3
Anjou (Québec) H1J 1B6
Tél.: (514) 355-7867
Fax: (514) 355-8750

CERTIFICAT DE CONFORMITÉ CERTIFICATE OF COMPLIANCE

6060

DART Aerospace LTD
Client / Customer

100000243
Votre # de commande / Your purchase order #

1 Lot of pieces
de la pièce / part

97726
Notre # de bon de livraison / Our packing slip #

Inspecteur / Inspector	<u>Renault</u>	Date, équipe / Date, shift	<u>Dec 31, 2005</u>
Placage / Plating	<u>Q9P-416F CLASS I Type II</u>		
Quantité totale / Total quantity	<u>1 Lot</u>	Quantité inspectée / Inspected quantity	<u>1 Lot</u>
Adhésion / Adhesion	<u>good</u>		
Épaisseur / Thickness	L.C.D.	H.C.D.	Moy. / aver. <u>0.0005</u>
Coussures, taches / Leach, spots	<u>NO</u>	Rugosité / Roughness	<u>NO</u>
Quantité approuvée / Approved quantity	<u>1 Lot</u>	Quantité rejetée / Rejected quantity	<u>NO</u>

Commentaires / Comments

D2968-041-B24537 = 41 Pcs
D2968-043-B24410 = 43 Pcs

Nous certifions que les pièces énumérées ci-dessus ont été faites en conformité avec vos dessins et spécifications et rencontrent les exigences contenues dans ces dessins et/ou spécifications.

We hereby certify that the parts listed above have been made in accordance with your drawings and specifications and are correct to the requirements contained in those drawings and/or specifications.

Signé au nom de
Signed on behalf of

**MANCO
DOMPLEX**



VAC AERO
INTERNATIONAL INC.

RELEASE NOTE

GST No.: R105468102

OAK 70940-1



HEAD OFFICE
1371 SPEERS ROAD, OAKVILLE, ONTARIO
CANADA L6L 2X5
TEL: (905) 827-4171 FAX: (905) 827-7489



2009 WYECROFT ROAD, UNIT B
OAKVILLE, ONTARIO
CANADA L6L 6J4
TEL: (905) 827-7377 FAX: (905) 827-1980



QUEBEC DIVISION
7450 RUE VENITE STREET, ST. LAURENT, QUEBEC
CANADA H4S 1C5
TEL: (514) 334-4240 FAX: (514) 334-6269

12/20/2005

MM/DD/YYYY

PAGE: 1

BILL TO: 1DAR01
DART AEROSPACE LTD.
1270 ABERDEEN ST.
HAWKESBURY, ON

SHIP TO: MANCO DOMPLES
4660 HICKMORE
ST. LAURENT, QUEBEC

K6A 1K7

H4T 1K7

DATE SHIPPED	SHIP VIA	F.O.B.
12/20/2005		ORIGIN
CUSTOMER P/O No.	JOB No.	TERMS
PO00000242		COD

PART No.	DESCRIPTION	UOM	QTY ORD	QTY SHPO	TEST RESULTS
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D2968-041 D2968-043 EA 84 84
TOW RING

Process Specifications: Procedure: 4047
HEAT TREATED AS PER DRAWING TO 125 KSI MIN.
HRC 27-32.5
MATERIAL: 4130

41 PCS, D2968-041, B24537
43 PCS, D2968-043, B24410

100% HARDNESS TESTED

29/30 HRC

JF



I hereby certify that the material covered by this release note has been inspected and tested and conforms to all specifications relevant thereto in accordance with the conditions of the contract / or purchase order.

ON BEHALF OF VAC AERO INTERNATIONAL INC.

Authorized Q.C. Inspector



VACUUM BRAZING - HEAT TREATING - SPECIAL PROCESSING - FURNACE EQUIPMENT
TURBINE COMPONENT OVERHAUL - PLASMA AND OTHER COATINGS

VAC AERO THERMAL

905-825-8303

01/06/2006 10:10

